

FCC Test Report

Equipment : Wireless Receiver
Brand Name : Wacom
Model No. : INF-A091
FCC ID : HV4INFA091
Standard : 47 CFR FCC Part 15.249
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DXX
Applicant : Wacom Co., Ltd.
Manufacturer : 2-510-1 Toyonodai, Kazo-shi,
Saitama 349-1148, Japan

The product sample received on Oct. 16, 2014 and completely tested on Nov. 22, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Vic Hsiao / Supervisor





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APPENDIX A. TEST PHOTOS

APPENDIX B. PHOTOGRAPHS OF EUT



Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.164138MHz 28.46 (Margin 26.79dB) - AV 49.24 (Margin 16.01dB) - QP	FCC 15.207	Complied
3.2	15.215(c)	Emission Bandwidth	1.7077 MHz; fall in band	Information only	Complied
3.3	15.249(a)	Fundamental Emissions	[dBuV/m at 3m]: 79.63 (Margin 14.37dB) average	[dBuV/m at 3m]: average: 94	Complied
3.4	15.249(a)/(d)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]:9760.00MHz 58.01 (Margin 15.99dB) - PK 45.33 (Margin 8.67dB) - AV	Harmonics: 54 dBuV/m@3m Other band: 50 dB or FCC 15.209, whichever is the lesser attenuation.	Complied

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	Modulation	Ch. Frequency (MHz)	Channel Number	Fundamental Field Strength (dBuV/m)
2400-2483.5	GFSK	2402-2478	77	79.63

Note 1: Field strength performed average level at 3m.

1.1.2 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input type="checkbox"/>	External antenna (dedicated antennas) ; Unique antenna connector

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	<input type="checkbox"/> Production ; <input checked="" type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ...
<input type="checkbox"/>	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
<input type="checkbox"/>	Operated normally mode for worst duty cycle
<input checked="" type="checkbox"/>	Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)	Duty Cycle Correction Factor [dB] = (20 log x)
<input checked="" type="checkbox"/> 23.21%	12.68

If worst duty < 100%, average emission = peak emission + 20 log x

1.1.5 EUT Operational Condition

Supply Voltage	<input type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	-	-
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> From System	

1.2 Support Equipment

Support Equipment - RF Conducted			
No.	Equipment	Brand Name	Model Name
1	Notebook	Dell	E5500

Support Equipment - AC Conduction & Radiated Emission			
No.	Equipment	Brand Name	Model Name
1	Notebook	Dell	E5530

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2009

1.4 Testing Location Information

Testing Location			
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.	
		TEL : 886-3-327-3456 FAX : 886-3-327-0973	
Test Site Registration Number: FCC 636805			
Test Condition	Test Site No.	Test Engineer	Test Environment
AC Conduction	CO04-HY	Zeus	24°C / 44%
RF Conducted	TH01-HY	Ian	23.4°C / 60%
Radiated Emission	03CH03-HY	Hunter	25°C / 50%

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty		
Test Item		Uncertainty
AC power-line conducted emissions		±2.2 dB
Emission bandwidth, 20dB bandwidth		±1.4 %
RF output power, conducted		±0.6 dB
All emissions, radiated	9 – 150 kHz	±2.4 dB
	0.15 – 30 MHz	±2.2 dB
	30 – 1000 MHz	±2.5 dB
	1 – 18 GHz	±3.5 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±3 %
DC and low frequency voltages		±3 %
Time		±1.4 %
Duty Cycle		±1.4 %

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration




Modulation Used for Conformance Testing	
Test Mode	Field Strength (dBuV/m at 3 m)
GFSK-Transmit	79.63

2.2 Test Channel Frequencies Configuration

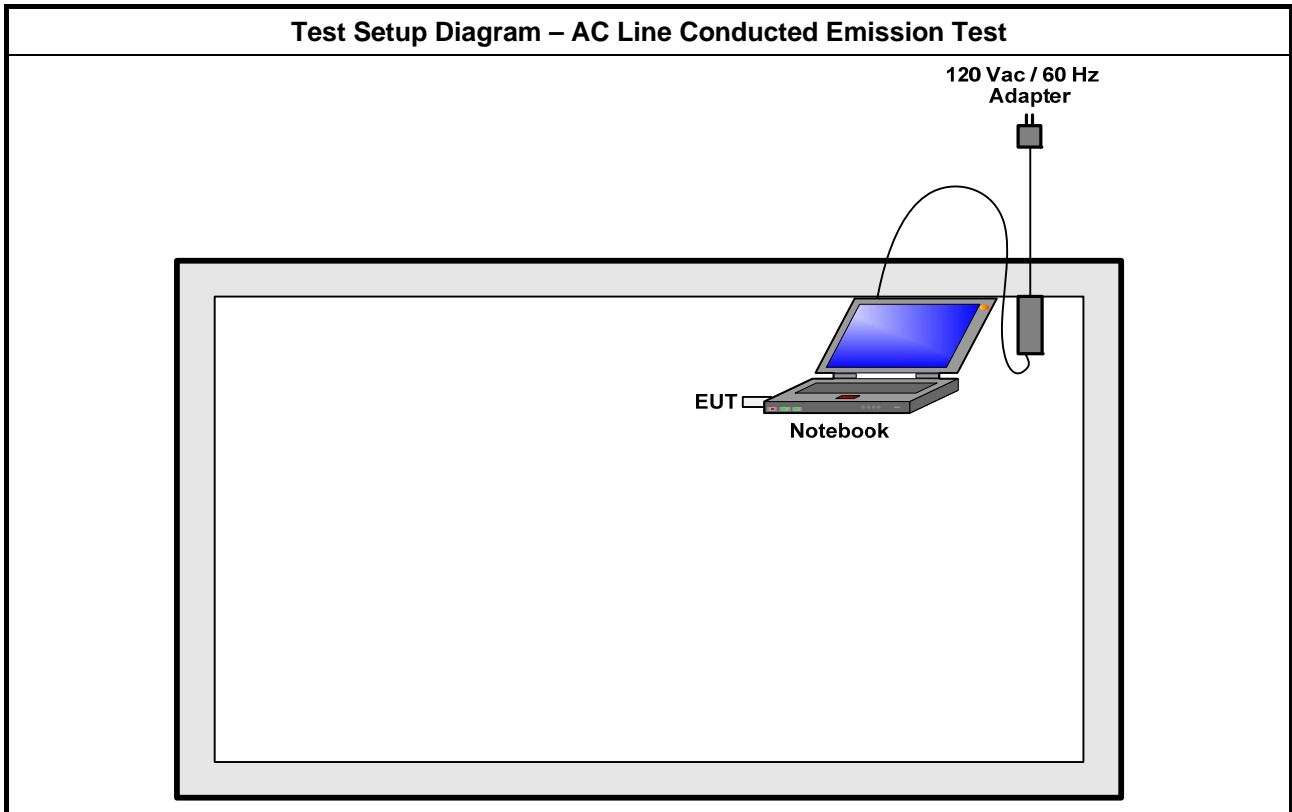
Test Channel Frequencies Configuration	
Test Mode	Test Channel Frequencies (MHz)
GFSK-Transmit	2402-(F1), 2440-(F2), 2478-(F3)

2.3 The Worst Case Measurement Configuration

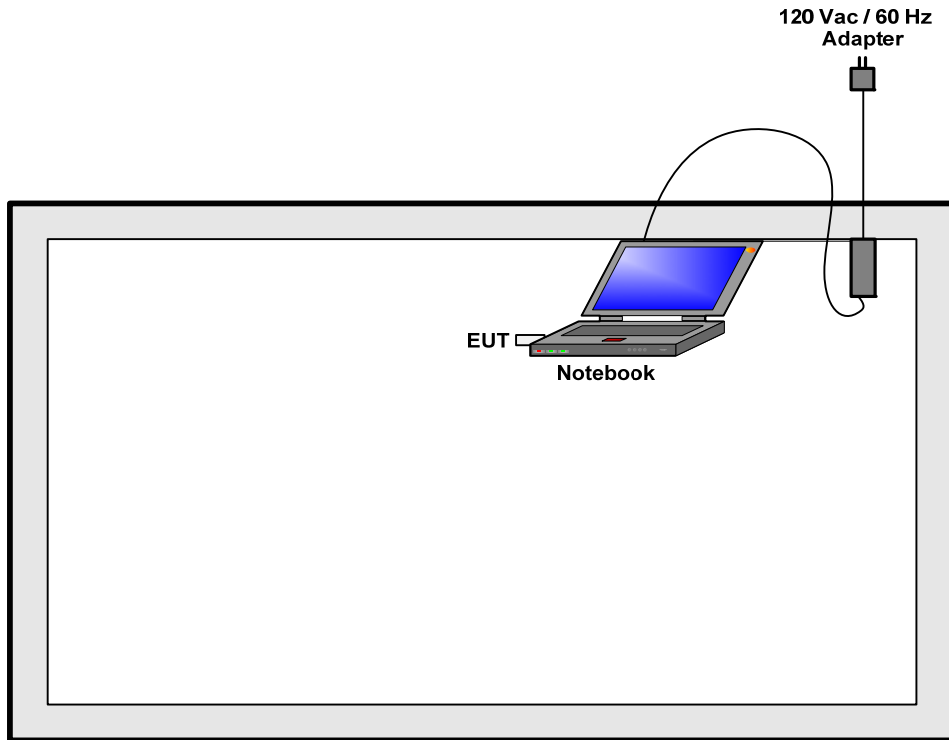
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral (120Vac / 60Hz)
Operating Mode	Operating Mode Description
1	Power from host & Radio link

The Worst Case Mode for Following Conformance Tests			
Tests Item		Emission Bandwidth, Fundamental Emissions, Radiated Unwanted Emissions	
Test Condition		Radiated measurement	
User Position		<input type="checkbox"/> EUT will be placed in fixed position.	
X Plane	Y Plane	Z Plane	<input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is X.
			<input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode		Operating Mode Description	
		Transmitter Mode	
Modulation Mode		GFSK-Transmit	

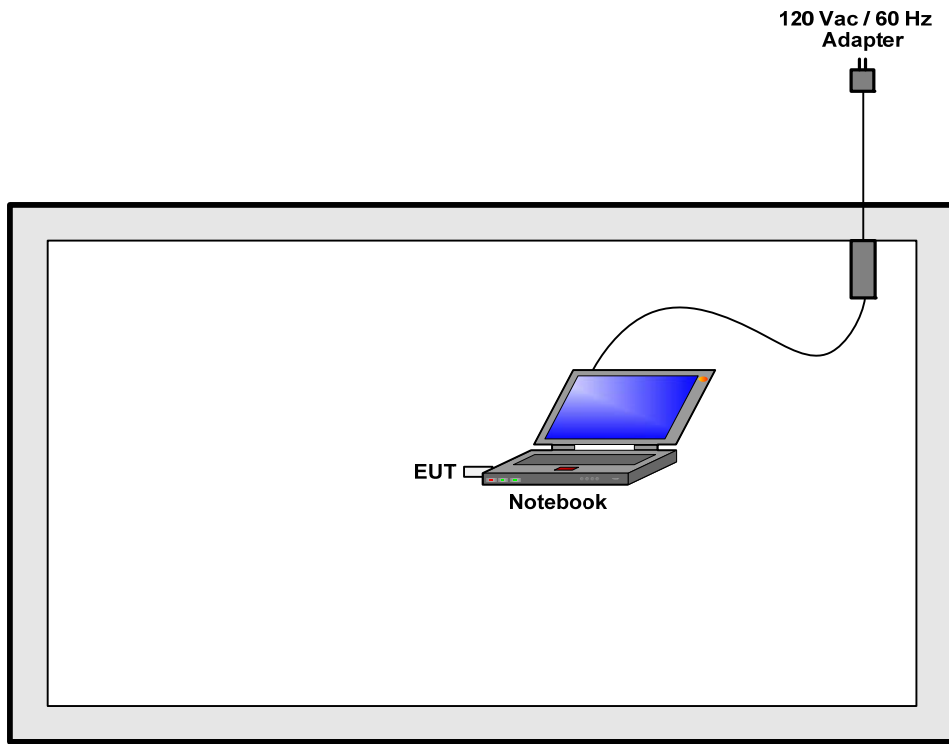
2.4 Test Setup Diagram



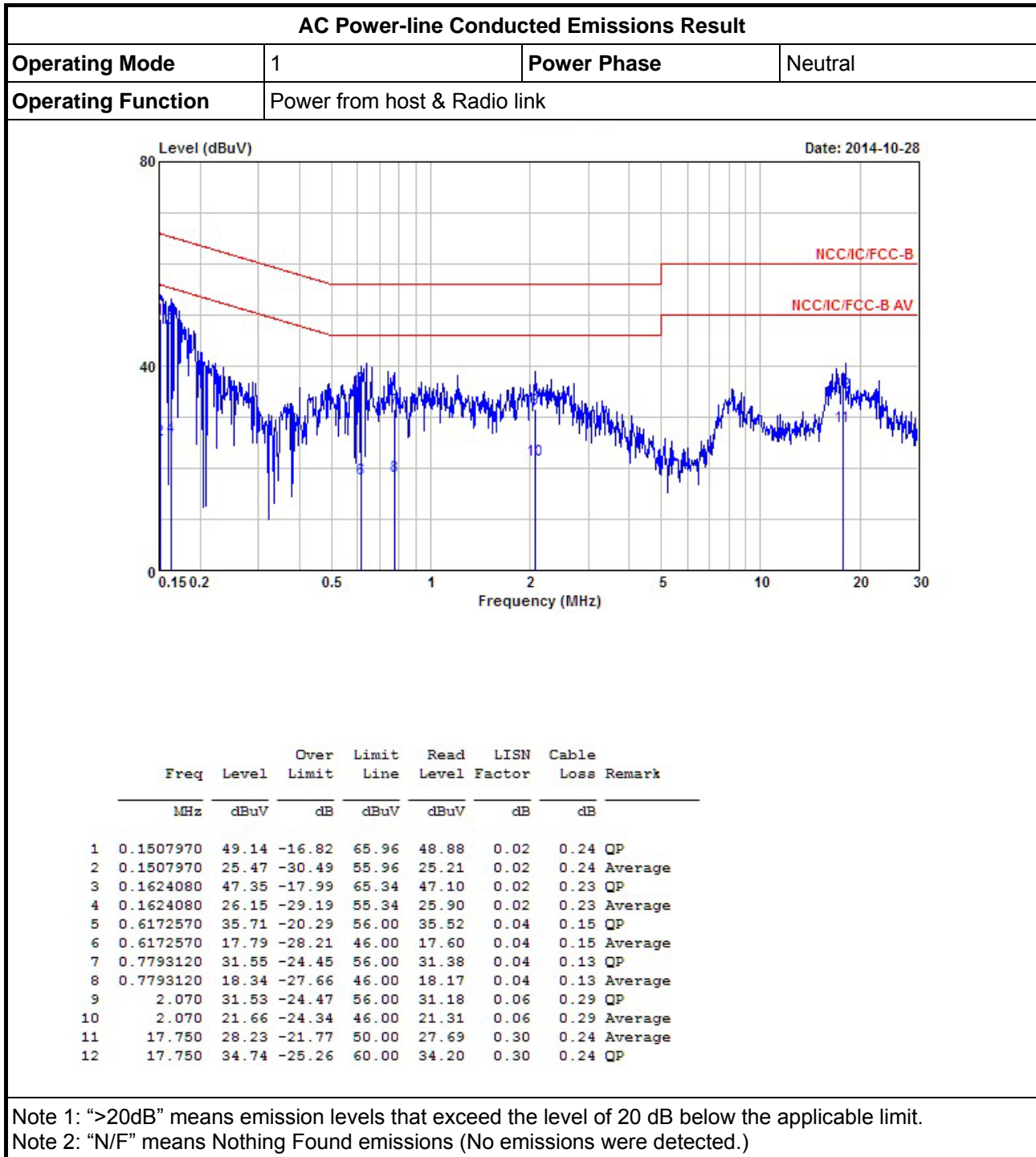
Test Setup Diagram - Radiated Below 1GHz Test

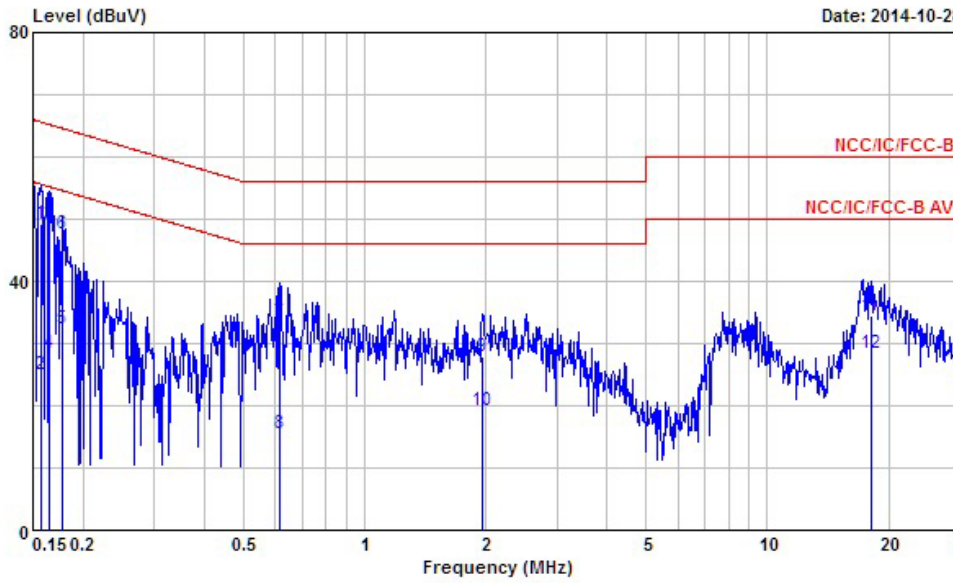


Test Setup Diagram - Radiated Above 1GHz Test



3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result																																																																																																																																										
Operating Mode	1	Power Phase	Line																																																																																																																																							
Operating Function	Power from host & Radio link																																																																																																																																									
<div style="display: flex; justify-content: space-between;"> Level (dBuV) Date: 2014-10-28 </div>  <p style="text-align: center;">Frequency (MHz)</p>																																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over</th> <th>Limit</th> <th>Read</th> <th>LISN</th> <th>Cable</th> <th></th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV</th> <th>Limit</th> <th>Line</th> <th>Level</th> <th>Factor</th> <th>Loss</th> <th>Remark</th> </tr> <tr> <th></th> <th></th> <th></th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.1564950</td> <td>49.22</td> <td>-16.43</td> <td>65.65</td> <td>48.95</td> <td>0.03</td> <td>0.24</td> <td>QP</td> </tr> <tr> <td>2</td> <td>0.1564950</td> <td>25.09</td> <td>-30.56</td> <td>55.65</td> <td>24.82</td> <td>0.03</td> <td>0.24</td> <td>Average</td> </tr> <tr style="border: 2px solid black;"> <td>3</td> <td>0.1641380</td> <td>49.24</td> <td>-16.01</td> <td>65.25</td> <td>48.98</td> <td>0.03</td> <td>0.23</td> <td>QP</td> </tr> <tr> <td>4</td> <td>0.1641380</td> <td>28.46</td> <td>-26.79</td> <td>55.25</td> <td>28.20</td> <td>0.03</td> <td>0.23</td> <td>Average</td> </tr> <tr> <td>5</td> <td>0.1777150</td> <td>32.46</td> <td>-22.13</td> <td>54.59</td> <td>32.21</td> <td>0.03</td> <td>0.22</td> <td>Average</td> </tr> <tr> <td>6</td> <td>0.1777150</td> <td>47.54</td> <td>-17.05</td> <td>64.59</td> <td>47.29</td> <td>0.03</td> <td>0.22</td> <td>QP</td> </tr> <tr> <td>7</td> <td>0.6139960</td> <td>33.32</td> <td>-22.68</td> <td>56.00</td> <td>33.13</td> <td>0.04</td> <td>0.15</td> <td>QP</td> </tr> <tr> <td>8</td> <td>0.6139960</td> <td>15.52</td> <td>-30.48</td> <td>46.00</td> <td>15.33</td> <td>0.04</td> <td>0.15</td> <td>Average</td> </tr> <tr> <td>9</td> <td>1.960</td> <td>27.89</td> <td>-28.11</td> <td>56.00</td> <td>27.52</td> <td>0.07</td> <td>0.30</td> <td>QP</td> </tr> <tr> <td>10</td> <td>1.960</td> <td>19.28</td> <td>-26.72</td> <td>46.00</td> <td>18.91</td> <td>0.07</td> <td>0.30</td> <td>Average</td> </tr> <tr> <td>11</td> <td>18.040</td> <td>34.45</td> <td>-25.55</td> <td>60.00</td> <td>33.92</td> <td>0.29</td> <td>0.24</td> <td>QP</td> </tr> <tr> <td>12</td> <td>18.040</td> <td>28.33</td> <td>-21.67</td> <td>50.00</td> <td>27.80</td> <td>0.29</td> <td>0.24</td> <td>Average</td> </tr> </tbody> </table>					Freq	Level	Over	Limit	Read	LISN	Cable			MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark				dB	dBuV	dBuV	dB	dB		1	0.1564950	49.22	-16.43	65.65	48.95	0.03	0.24	QP	2	0.1564950	25.09	-30.56	55.65	24.82	0.03	0.24	Average	3	0.1641380	49.24	-16.01	65.25	48.98	0.03	0.23	QP	4	0.1641380	28.46	-26.79	55.25	28.20	0.03	0.23	Average	5	0.1777150	32.46	-22.13	54.59	32.21	0.03	0.22	Average	6	0.1777150	47.54	-17.05	64.59	47.29	0.03	0.22	QP	7	0.6139960	33.32	-22.68	56.00	33.13	0.04	0.15	QP	8	0.6139960	15.52	-30.48	46.00	15.33	0.04	0.15	Average	9	1.960	27.89	-28.11	56.00	27.52	0.07	0.30	QP	10	1.960	19.28	-26.72	46.00	18.91	0.07	0.30	Average	11	18.040	34.45	-25.55	60.00	33.92	0.29	0.24	QP	12	18.040	28.33	-21.67	50.00	27.80	0.29	0.24	Average
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<p>Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)</p>																																																																																																																																										

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit
<input checked="" type="checkbox"/> Emission bandwidth falls completely within authorized band.

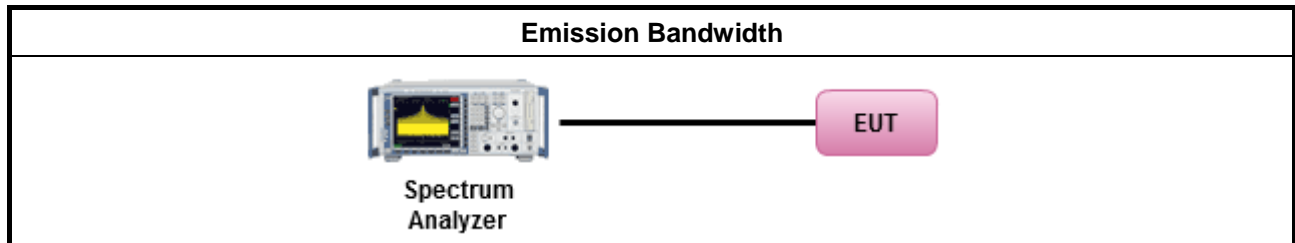
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

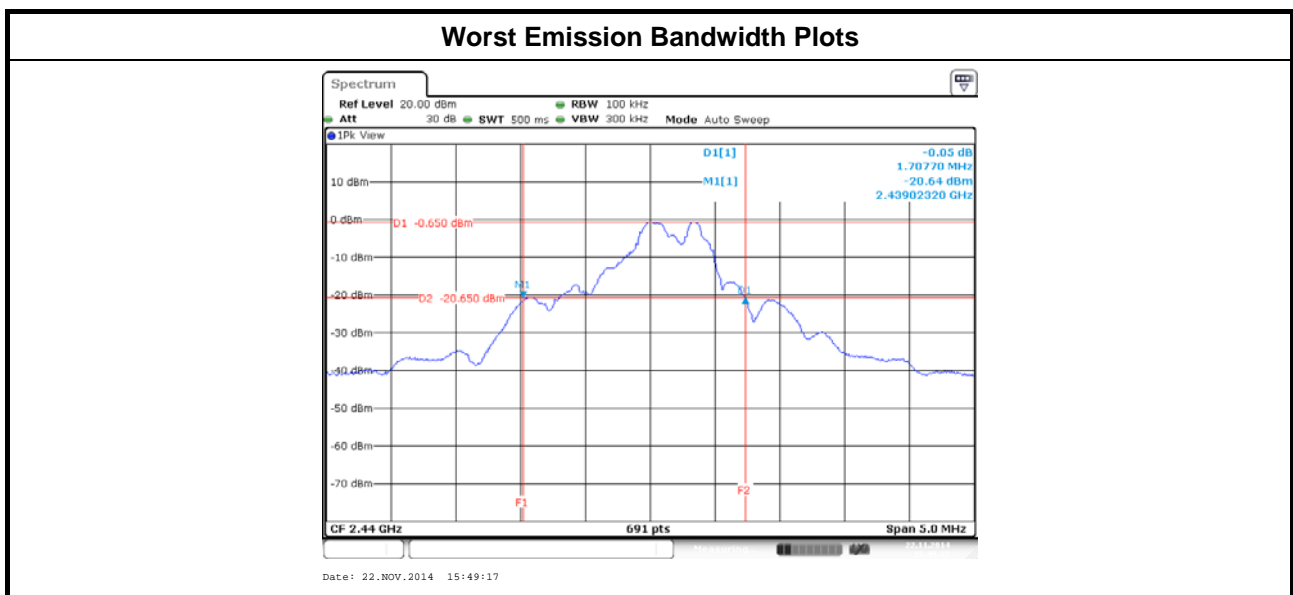
Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for 20 dB emission bandwidth and 99% occupied bandwidth measurement.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result					
Modulation Mode	Frequency (MHz)	99% Bandwidth (MHz)	20dB BW (MHz)	F _L at 20dB BW (MHz)	F _H at 20dB BW (MHz)
GFSK-Transmit	2402	1.6497	1.6787	2401.0521	-
GFSK-Transmit	2440	1.7583	1.7077	-	-
GFSK-Transmit	2478	1.7800	1.6715	-	2478.7308
Limit		N/A	N/A	2400	2483.5
Result		Complied			



3.3 Fundamental Emissions

3.3.1 Fundamental Emissions Limit

Fundamental Emissions E-Field Strength Limit (3m)	
<input type="checkbox"/>	902-928 MHz Band: 94 dBuV/m (quasi peak)
<input checked="" type="checkbox"/>	2400-2483.5 MHz Band: 94 dBuV/m (average)
<input type="checkbox"/>	5725-5785 MHz Band: 94 dBuV/m (average)

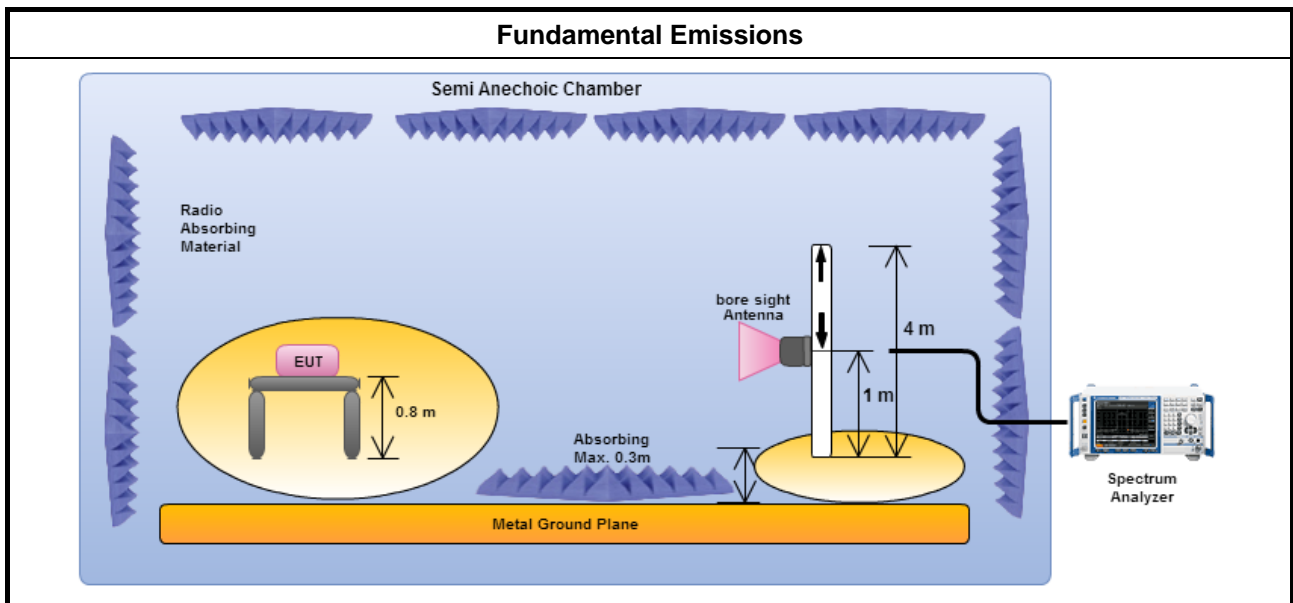
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

<input checked="" type="checkbox"/>	The average emission levels shall be measured in [by duty cycle correction factor].
<input checked="" type="checkbox"/>	For the transmitter emissions shall be measured using following options below:
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle \geq 100%.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from $20 \log(\text{dwell time}/100 \text{ ms})$. Average emission = peak emission + 20 log (duty cycle).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions and test distance is 3m.

3.3.4 Test Setup



3.3.5 Test Result of Fundamental Emissions

Field Strength of Fundamental Emissions Result					
Modulation Mode	Frequency (MHz)	Fundamental (dBuV/m)@3m	Margin (dB)	Limit (dBuV/m)@3m	Type
GFSK-Transmit	2402	87.54	26.46	114	peak
GFSK-Transmit	2402	74.86	19.14	94	average
GFSK-Transmit	2440	89.15	24.85	114	peak
GFSK-Transmit	2440	76.47	17.53	94	average
GFSK-Transmit	2478	92.31	21.69	114	peak
GFSK-Transmit	2478	79.63	14.37	94	average
Result		Complied			
Note 1: Measurement worst emissions of receive antenna polarization: Horizontal. Note 2: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).					



3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit	
Harmonics:	
<input checked="" type="checkbox"/>	54 dBuV/m (average)
Other Unwanted Emissions:	
<input checked="" type="checkbox"/>	50 dB below the level of the fundamental or FCC 15.209, whichever is the lesser attenuation.

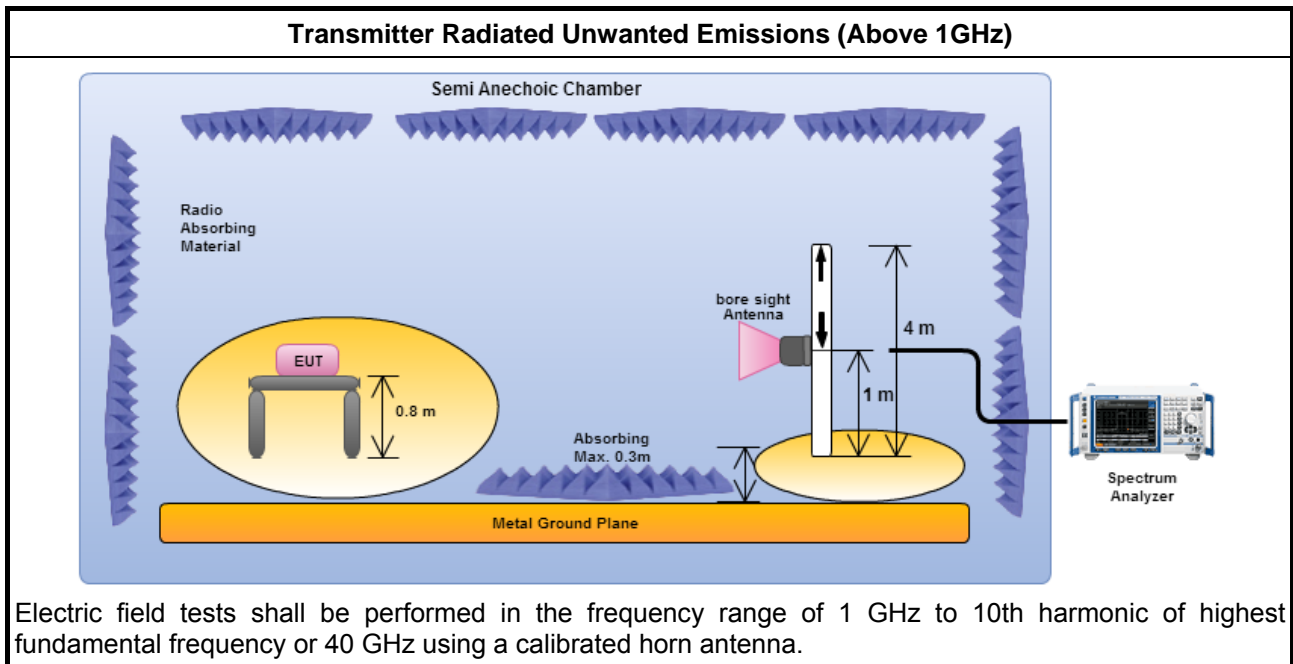
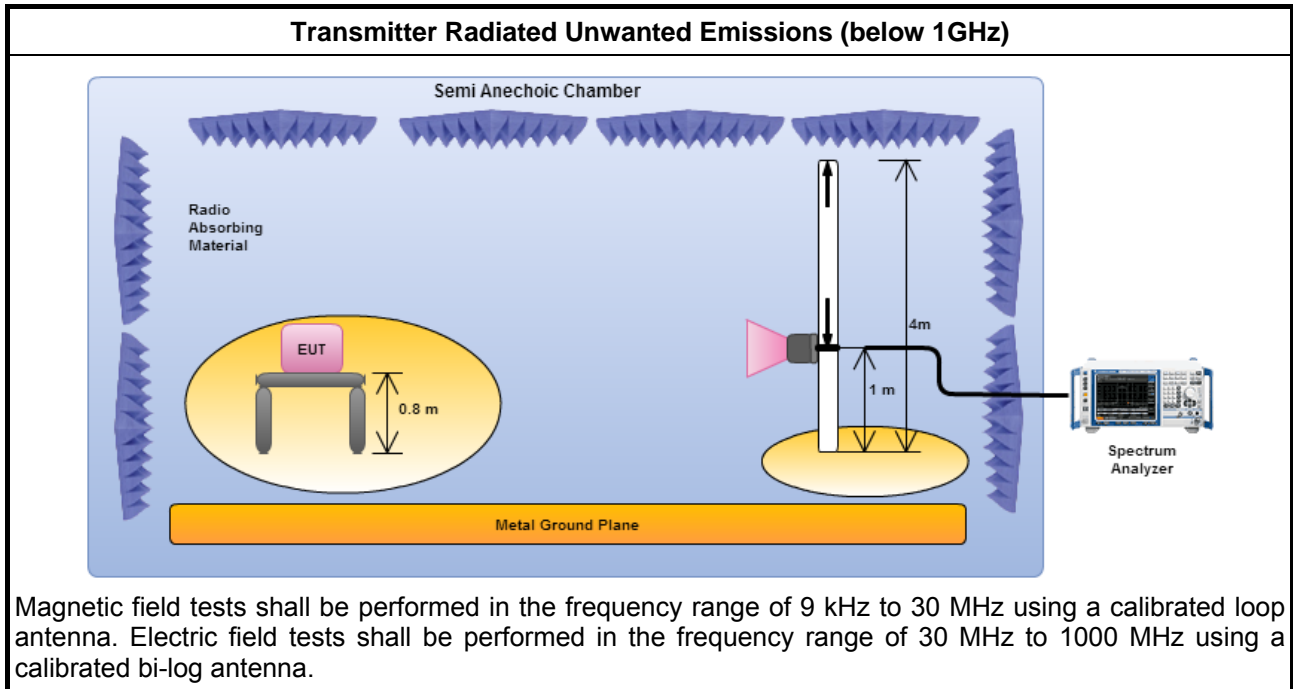
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method – General Information	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
<input checked="" type="checkbox"/>	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/>	For the transmitter bandedge emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
<input checked="" type="checkbox"/>	For radiated measurement.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	The any unwanted emissions level shall not exceed the fundamental emission level.
<input checked="" type="checkbox"/>	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

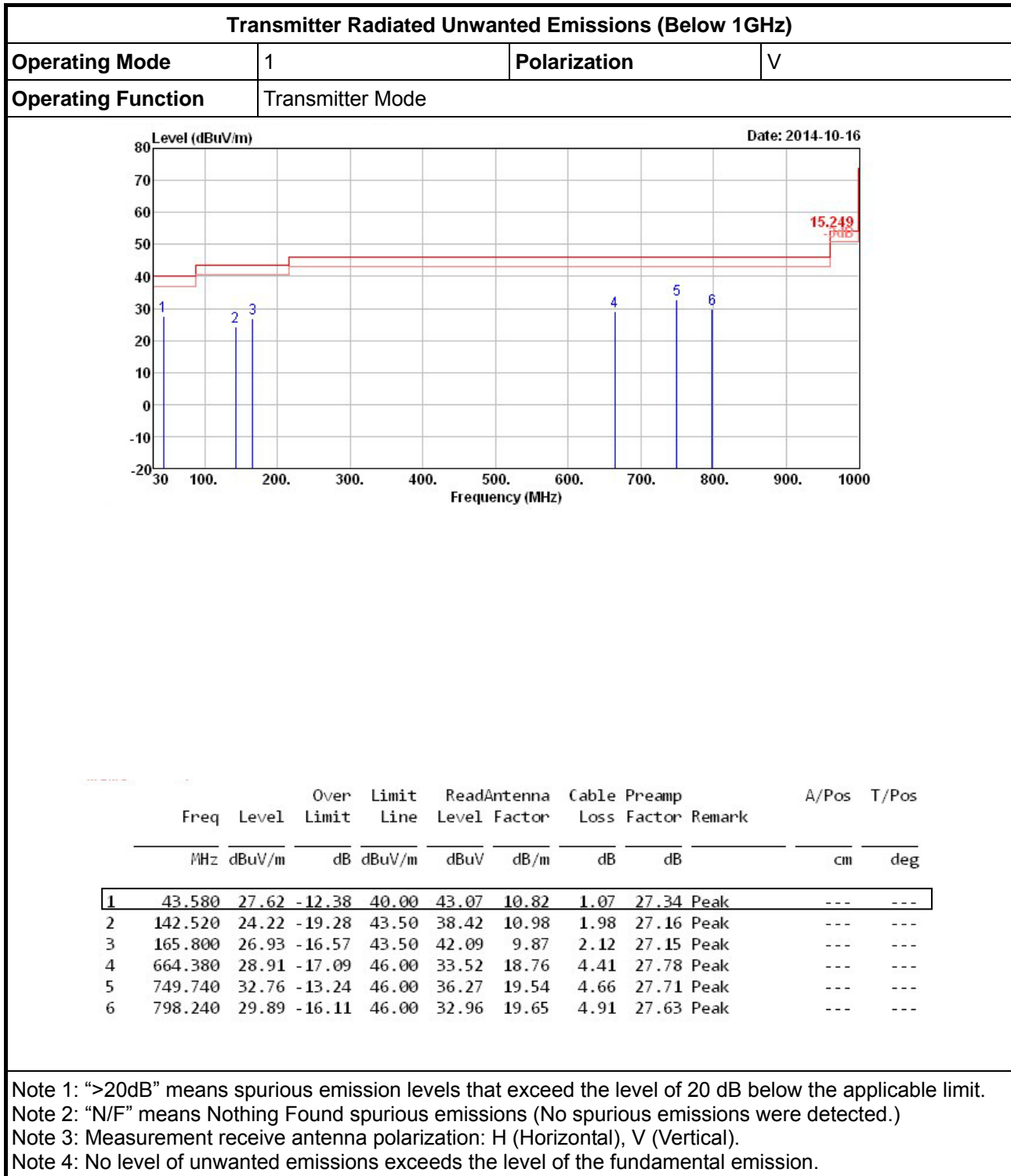
3.4.4 Test Setup



3.4.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

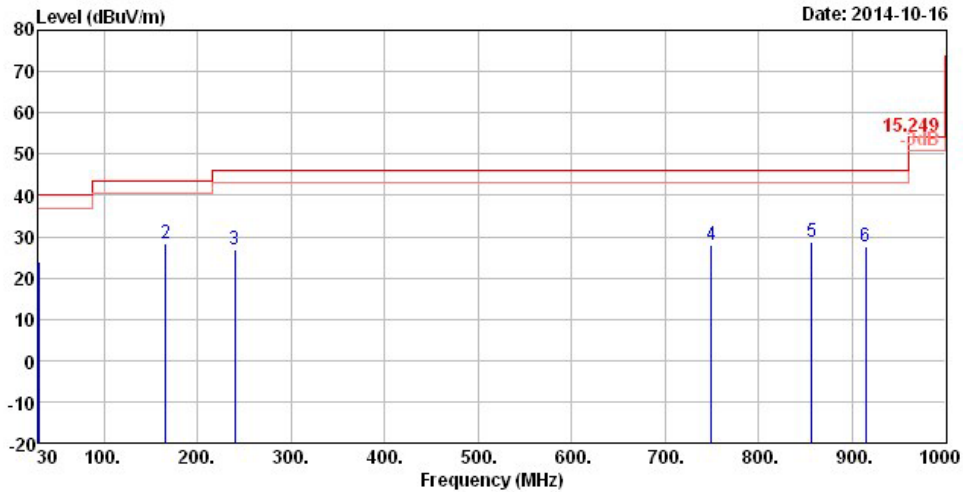
3.4.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)





Transmitter Radiated Unwanted Emissions (Below 1GHz)

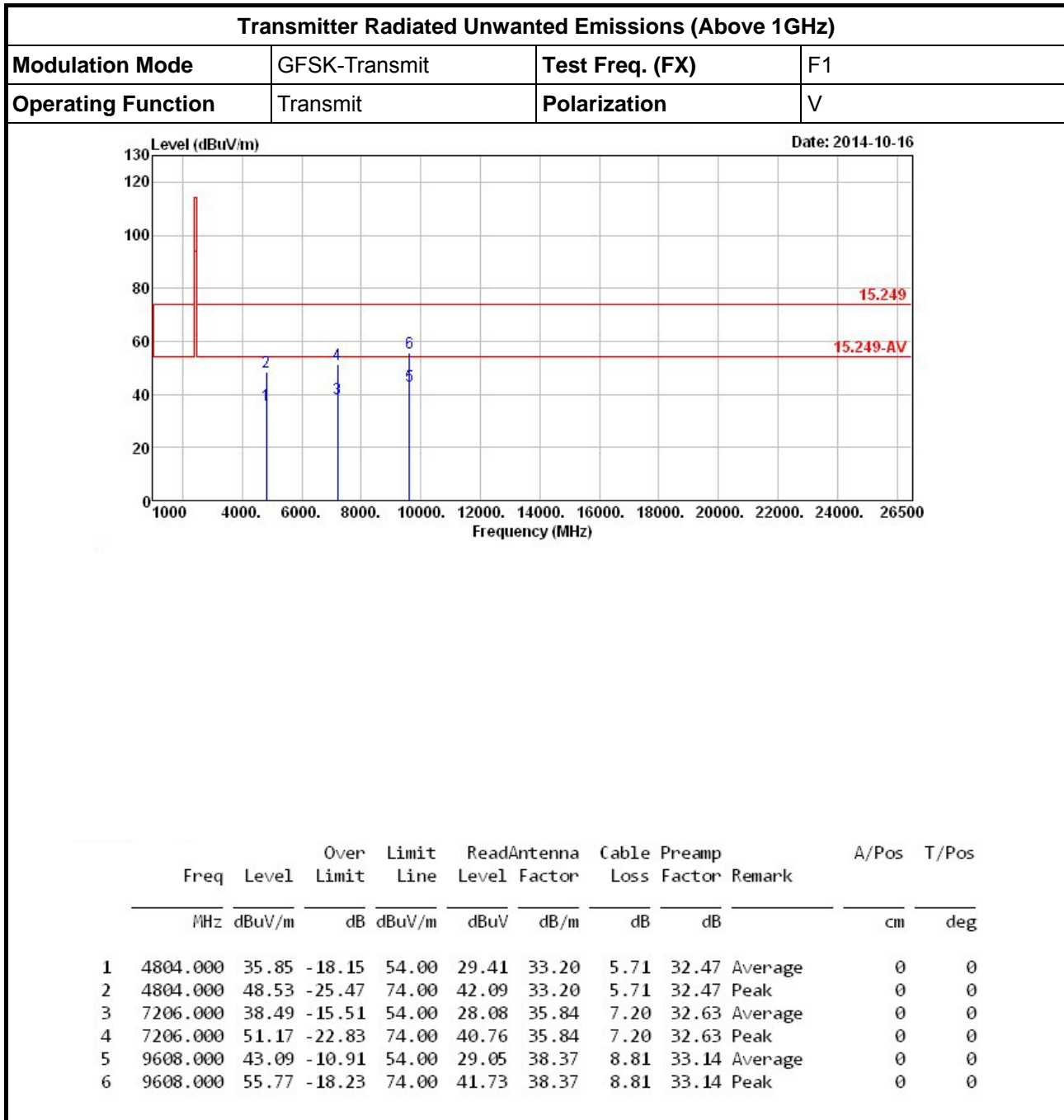
Operating Mode	1	Polarization	H
Operating Function	Transmitter Mode		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	30.000	24.02	-15.98	40.00	31.74	18.85	0.82	27.39	Peak	---	---
2	165.800	28.19	-15.31	43.50	43.35	9.87	2.12	27.15	Peak	---	---
3	239.520	26.76	-19.24	46.00	39.43	11.73	2.55	26.95	Peak	---	---
4	749.740	27.88	-18.12	46.00	31.39	19.54	4.66	27.71	Peak	---	---
5	856.440	28.64	-17.36	46.00	30.80	20.32	4.96	27.44	Peak	---	---
6	914.640	27.55	-18.45	46.00	29.03	20.60	5.23	27.31	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical).
 Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

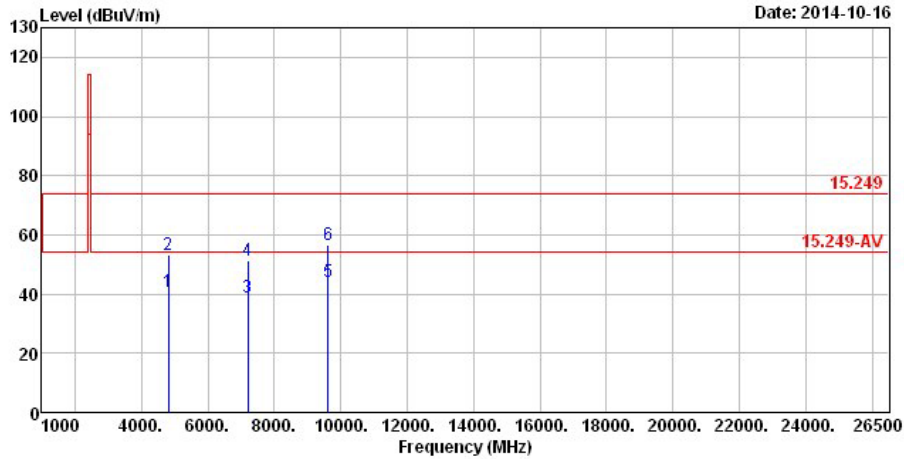


Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
 Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	GFSK-Transmit	Test Freq. (FX)	F1
Operating Function	Transmit	Polarization	H

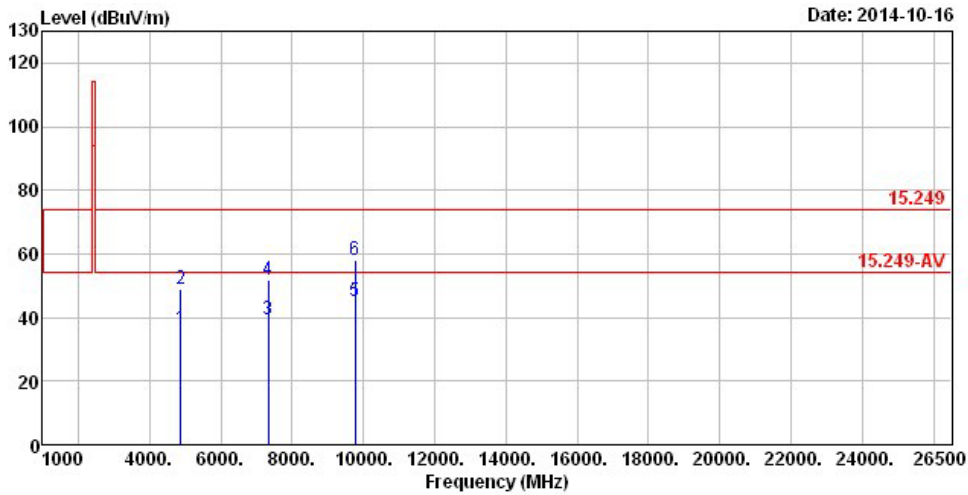


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	4804.000	40.66	-13.34	54.00	34.22	33.20	5.71	32.47	Average	0	0
2	4804.000	53.34	-20.66	74.00	46.90	33.20	5.71	32.47	Peak	0	0
3	7206.000	38.83	-15.17	54.00	28.42	35.84	7.20	32.63	Average	0	0
4	7206.000	51.51	-22.49	74.00	41.10	35.84	7.20	32.63	Peak	0	0
5	9608.000	43.94	-10.06	54.00	29.90	38.37	8.81	33.14	Average	0	0
6	9608.000	56.62	-17.38	74.00	42.58	38.37	8.81	33.14	Peak	0	0

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
- Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

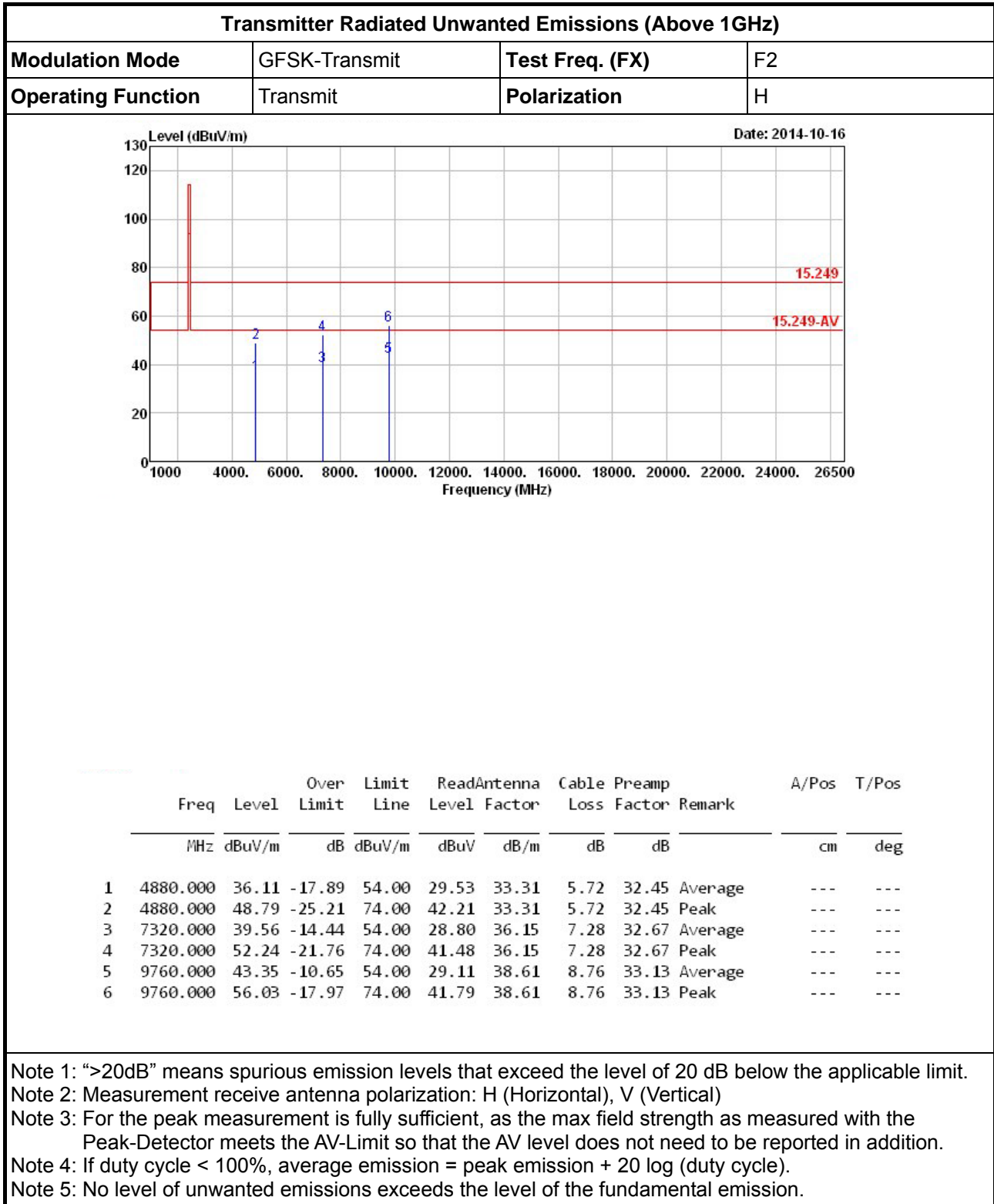
Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	GFSK-Transmit	Test Freq. (FX)	F2
Operating Function	Transmit	Polarization	V



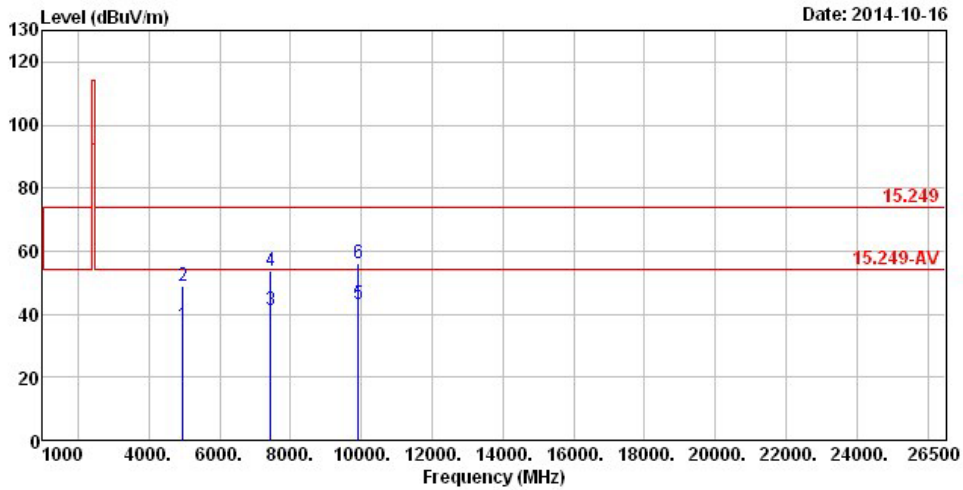
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4880.000	36.22	-17.78	54.00	29.64	33.31	5.72	32.45	Average	0	0
2	4880.000	48.90	-25.10	74.00	42.32	33.31	5.72	32.45	Peak	0	0
3	7320.000	39.30	-14.70	54.00	28.54	36.15	7.28	32.67	Average	0	0
4	7320.000	51.98	-22.02	74.00	41.22	36.15	7.28	32.67	Peak	0	0
5	9760.000	45.33	-8.67	54.00	31.09	38.61	8.76	33.13	Average	0	0
6	9760.000	58.01	-15.99	74.00	43.77	38.61	8.76	33.13	Peak	0	0

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
 Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.





Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	GFSK-Transmit	Test Freq. (FX)	F3
Operating Function	Transmit	Polarization	V

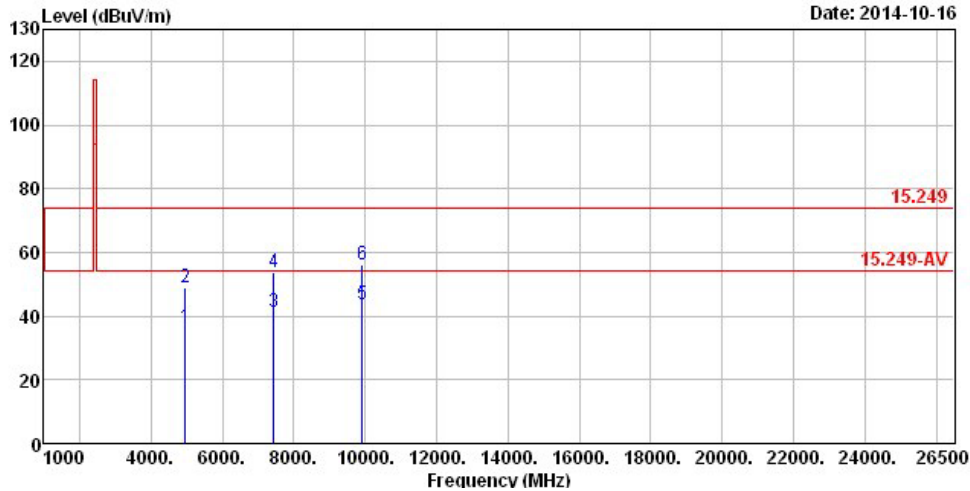


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4956.000	36.32	-17.68	54.00	29.58	33.44	5.74	32.44	Average	---	---
2	4956.000	49.00	-25.00	74.00	42.26	33.44	5.74	32.44	Peak	---	---
3	7434.000	41.11	-12.89	54.00	30.04	36.42	7.37	32.72	Average	---	---
4	7434.000	53.79	-20.21	74.00	42.72	36.42	7.37	32.72	Peak	---	---
5	9912.000	43.31	-10.69	54.00	28.87	38.86	8.71	33.13	Average	---	---
6	9912.000	55.99	-18.01	74.00	41.55	38.86	8.71	33.13	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
 Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	GFSK-Transmit	Test Freq. (FX)	F3
Operating Function	Transmit	Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4956.000	36.32	-17.68	54.00	29.58	33.44	5.74	32.44	Average	---	---
2	4956.000	49.00	-25.00	74.00	42.26	33.44	5.74	32.44	Peak	---	---
3	7434.000	41.22	-12.78	54.00	30.15	36.42	7.37	32.72	Average	---	---
4	7434.000	53.90	-20.10	74.00	42.83	36.42	7.37	32.72	Peak	---	---
5	9912.000	43.46	-10.54	54.00	29.02	38.86	8.71	33.13	Average	---	---
6	9912.000	56.14	-17.86	74.00	41.70	38.86	8.71	33.13	Peak	---	---

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
- Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Mar. 26, 2014	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 21, 2014	AC Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	7.61183201e+012	9kHz ~ 30MHz	Oct. 30, 2013	AC Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	AC Conduction

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101013	9kHz ~ 40GHz	Jan. 25, 2014	RF Conducted
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jul. 31, 2014	RF Conducted
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jul. 26, 2014	RF Conducted

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Nov. 30, 2013	Radiation
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 05, 2014	Radiation
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Sep. 01, 2014	Radiation
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Mar. 27, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 20, 2014	Radiation
Horn Antenna	ETS · LINDGREN	3115	6741	1GHz ~ 18GHz	Jun. 11, 2014	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 10, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 16, 2013	Radiation
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 11, 2013	Radiation
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiation

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	Dec. 02, 2012	Radiation

Note: Calibration Interval of instruments listed above is two years.